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PATENT

Docket No. 021016-1

Provisional Patent Application Serial No. 60/424,890

**PUSH UP/PULL UP**

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**EXERCISE APPARATUS AND METHODS FOR USE****CROSS REFERENCE TO RELATED APPLICATION**

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The present invention claims the benefit of Provisional Patent application Ser. No. 60/424,890 filed Nov. 08, 2002, the full disclosures are incorporated herein by reference.

**SUMMARY OF THE INVENTION**

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**BACKGROUND OF THE INVENTION****1. Field of the Invention**

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The present invention is a pushup trainer that will assist the user by increasing or decreasing the force required by increasing or decreasing the weight of the user with the aid of a mechanical means such as a spring, spring bar, elastic bands, hydrodynamics, etc. while performing pushups.

**2. Description of the Related Art**

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The benefits of performing pushups for increased upper body development are well known. Pushups are one of the best exercises for strengthening the triceps, pectorals, and deltoids. Unlike weight training, pushups can be performed without the need for a spotter, and place less stress on the joints.

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5 Several other inventors have proposed various devices for increasing the benefits of performing pushups. However, no other inventor within the knowledge of the present inventor has proposed a pushup trainer having the advantages of the present invention. Specifically, no other pushup trainer provides for an aid of the user to decrease (or increase) the force required to do a push-up. For the majority of individuals, push-ups  
10 can be too difficult to do with any significant amount or without doing them from the knees. Hence individuals refrain from doing push ups because they loose enthusiasm. The present invention provides for a force-assist device that allows the user to decrease (or increase for those over zealous athletes) the force required to do push-ups. With this aid, the user can then do more push-ups and remain more enthused for this important  
15 strength training exercise.

U.S. Pat. No. 4,854,573 to Johansson discloses an exercise apparatus which has three hand grips having different elevations which are individually selectable to vary the degree of difficulty of push-up exercises. The Johansson *device* rests on a floor and is  
20 rotatable to a plurality of positions. While this *device* allows for different levels of difficulty, the range of difficulties that may be provided by this *device* is rather limited unless the *device* is built to an unduly and inconveniently large size.

U.S. Pat. No. 5,181,897 to Agan provides an exercise apparatus which relies on a non-  
25 planar surface other than a floor to enable a user to perform inclined push-up exercises. The Agan *device* includes angled brackets which are configured to conform to an edge of an object. However, the degree of difficulty which may be selected using this *device* is dependent upon whatever appropriate surfaces are accessible to a user. In certain circumstances, therefore, the range of difficulty levels which may be selected may be  
30 limited. Further, the Agan *device* is configured to receive an edge of an object in such a manner that the *device* may rock during normal exercise. Rocking during exercise tends to make the exercise more difficult and less enjoyable, while increasing the risk that the exercise *device* will become dislodged from the object upon which it is placed, thereby resulting in an injury to the user.

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One example of a pushup trainer is U.S. Pat. No. 3,115,338, issued to Katherine and Peter  
Acs on Dec. 24, 1963. This patent describes a pair of handles having a flat base. The base  
rests on the floor, while a person performing pushups grips the handles. The handles may  
have a base with a suction cup, so that the suction cup can attach to a wall, allowing the  
10 user to grasp the grip to maintain his balance. A third embodiment has a hook-shaped  
bolt, allowing the handles to hang from an overhead support for performing pull-ups.

U.S. Pat. No. 4,351,525, issued to William L. Rozenblad on Sept. 28, 1982, describes a  
pair of wood platforms, each having a non-skid surface on the bottom, and a U-shaped  
15 handle on top. The handles may be used in pairs for performing pushups, or only a single  
handle may be used to provide for a more difficult pushup.

U.S. Pat. No. 4,610,448, issued to David L. Hill on Sept. 9, 1986, describes a pushup  
training *device* having both handgrips pivotally attached to the same base. The U-shaped  
20 bracket supporting the handgrips can rotate around a vertical axis, and the handgrips can  
rotate around a longitudinal horizontal axis.

U.S. Pat. No. 5,205,802, issued to William J. Swisher on Apr. 27, 1993, describes a  
pushup training *device* having a single elongated base for a pair of handgrips. The base  
25 includes holes positioned at various distances from its vertical center, allowing the  
handgrips to be positioned at a desired distance from the center. The handgrips can rotate  
around a vertical axis as the user performs pushups.

U.S. Pat. No. 5,226,868, issued to Calvin W. Montgomery on Jul. 13, 1993, describes a  
30 pushup training *device* having a board and two C-shaped handles. The board has holes in  
various positions for attaching the handles. Only one end of the handles attaches to the  
board, allowing the handles to rotate around a vertical axis at the attachment point.

U.S. Pat. No. 5,607,380, issued to John E. Duty on Mar. 4, 1997, describes a pushup  
35 training *device* having a pair of bases, with each base supporting a gripping bar. The

5 gripping bar may be positioned at various desired angles. An elastic band extends from one handgrip to the other, passing over the back of the neck, to provide a workout for the neck muscles as the user pushes him up.

U.K. Pat. No. 2,270,636, published on Mar. 23, 1994, describes a pushup-training *device*  
10 having a board and a pair of U-shaped handles. The board has several sets of holes, allowing the user to position each of the handles in a pair of holes. The user can thereby set the handles a desired distance apart.

German Pat. No. 4,229,970, published on Mar. 10, 1994, describes an exercise *device*.

15 Additionally, several devices have been used to facilitate the performance of push-up exercises. For instance, U.S. Pat. No. 4,351,525 to Rozenblad, U.S. Pat. No. 4,358,106 to Shadford, and U.S. Pat. No. 4,621,806 to Wheeler, disclose various devices for supporting one or more handgrips on a floor or other flat planar surface.

20 The above devices are somewhat limited in that they place the hand grips a fixed distance from the floor during exercise. Many people, however, are not strong enough to do regular push-ups (i.e., where the hands and the feet are placed roughly along the same plane, the floor). The difficulty of performing a push-up exercise decreases if the weight  
25 bearing on the arms is decreased. It is often beneficial to decrease the level of difficulty of push-up exercises, since many people lack the strength to do standard push-up exercises. This may occur for example because of a previous injury or age. Alternatively, it may be beneficial to decrease the level of difficulty so that the number of repetitions may-be increased, thereby providing a better overall workout.

30 None of the above patents describes a pushup trainer allowing the user to selectively choose a preferred force that is used for the push-up. Thus a push-up trainer solving the aforementioned problems (a need exists for a *device* for facilitating the performance of push-up exercises over a wide range of difficulty levels) is desired.

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## SUMMARY OF THE INVENTION

The present invention is a pushup trainer having a base and a top with a force controller  
10 in between. This controller allows the user to aid them by increasing or decreasing the  
force (usually decreasing).

One embodiment of the present invention is that the top is placed against the chest area  
and then a spring type mechanism is placed between it and the bottom/base. As the user  
15 goes down to begin their first push up, the spring like mechanism pushes up on their  
chest, removing some force on their arms. As the user begins to push up and complete  
the push up, the spring like mechanism pushes up thus decreasing the force required.

Another embodiment would be a ring that is made of a spring material that is placed  
20 between the chest area and the floor to assist with push-ups. As the user allows  
him/herself to go toward the floor, the ring goes from a circular shape to oblong to  
eventually a flat, squashed loop. Because it is made of a spring material (metal or  
plastic), the squashed loop has a pushing force that will aid in pushing the user back up to  
this or her original position with the arms extended. This force on the ring is easily  
25 changed with the addition/deletion of springs, elastomeric bands in the  
transverse/horizontal position, etc.

A unique feature of the present device is that it decreases resistance and assists the user in  
completing the exercise, and does so very simply. Most other exercise devices provide  
30 resistance by the means of weights, belts, elastic straps, or hydraulics. In other words,  
they tend to make the exercise more difficult, rather than providing a means to make the  
exercise easier.

5 To facilitate comfort, the device may be provided with a soft compressible covering. It may be contoured to fit the general shape of the human chest. It may be bolstered so that much of the weight of the user is supported by the center of the chest and the upper chest, i.e., the sternum and sternal area and the large upper pectoral muscles provide much of the support to the user. This would diminish the pressure on  
10 the breast region, and facilitate comfort for female users.

To facilitate additional exercise, the device may be used as a pull-up device to exercise, strengthen, and tone muscle groups not addressed by the push up routine. The  
15 user would stand on the device. Additional bands or spring tension, in the preferred embodiment, may be needed to support the full weight of the user.

To provide a bar or hand hold for the pull-ups, a handle is connected to a U-shaped bracket that fits over the top of a door. The bracket is positioned near the hinged side of the door so that the hinges support most of the weight of the exercise. The user  
20 simply positions the assist device of the present invention adjacent to the closed door so that the user is facing the door. The handle of the pull-up bar is parallel with the closed door. The user then stands on the assist device and does pull-ups. The pull-up device may be provided with handles that project perpendicular to the door for exercising additional muscle groups, i.e., the biceps.

25 Since the doorways in most homes will not provide enough vertical height to allow a full extension pull-up, i.e., one beginning with the arms fully extended, if most users stand on the assist device of the current invention fully erect, the user may elect simply to flex the knees to allow the arms to be fully extended at the onset of the exercise.

30 Alternatively, a separate frame may be provided for the pull up routine.

Additionally, the user may elect to sit on the device to perform other exercises. By sitting on the device and placing each hand on a chair seat, the assist device will facilitate exercises that target the triceps and shoulder girdle muscles.

- 5 Devices described herein are generally the size to fit beneath or above the athlete's/user's chest. There may be different sizes and shapes for difference sizes and shapes of users.

### BRIEF DESCRIPTION OF THE DRAWINGS

- 10 FIGS. 1 & 2 are schematic illustrations of a device constructed in accordance with the principles of the present invention.

FIG. 1 is an isometric view of the preferred embodiment of the instant invention, the 'Push-Up Exercise Apparatus' or 'Pull-Up Apparatus' or 'Dip Apparatus'.

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FIG. 2 is an isometric illustration of the exercise apparatus of the instant invention with the user demonstrating the apparatus for use as a 'Push-Up Exercise' apparatus.

These illustrations show only some potential configurations of the present invention.

- 20 Other parametric changes of the present invention can occur such as location of the force element on the device as well as the actual type of mechanism(s) or element used.

### DESCRIPTION OF PREFERRED EMBODIMENTS

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FIG. 1 is an isometric drawing of the instant invention. This particular apparatus 1 is most suited to doing exercises such as push-ups, pull-ups or dips. The device 1 consists of a loop spring 2, a base 3 and a pad 4. The loop spring has been iteratively designed to add resistance (and subsequently help) to the user while doing exercise. The loop spring 2 is designed with a spring steel piece of flat stock spring steel that is approximately .036 inches thick and approximately 1.00 inches wide and approximately 132 inches long.

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The spring steel band or piece of flat stock is coiled into an approximate diameter 5 of 14 inches. This allows the spring steel band to be coiled three times around into the 14 inch 5 circle. The steel ban is then fastened, usually with a rivet (not shown) to hold the

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looped spring steel in the circular shape in a 14-inch diameter 5. A hole (approximately

5 .220 inches in diameter (not shown)) is then drilled through the three loops and centered for fastening the bottom 6 of the loop spring 2 to the base 3. This is most easily accomplished by screwing in a bolt with knob 7 into the base 3 and through the hole in the loop spring 2. The base 3 has a female thread centered in the base and directly below the screw 7. Additionally the base 3 has a crescent shaped groove 9 in the base 2 for  
 10 holding the loop spring 2 in position in the base. Even further, a crescent shaped block 6 with a hole drilled through it approximately .220 inches in diameter fits on top of the loop spring 2. The screw 7 with knob is then placed through the loop spring 2 then the crescent block 6 and finally into the base 3 and tightened. The crescent block 6 provides additional support to the exercise apparatus once assembled. The base is usually made of  
 15 a polymer plastic such as, but not limited to ABS plastic, which is molded into the preferred configuration show in FIG. 1. The base 3 has an approximate size of 14 inches by 14 inches as shown in the illustration. This base size allows the un-assembled apparatus to be easily packaged and stored with the base 3 fitting inside the loop spring 2. The pad 4 can be fabricated of several softer polymers such as polyurethane foam of  
 20 other polymer foams. The pad provides a softer edge on the topside of the exercise apparatus and adds comfort to the user. In the case of pus-ups, against the chest, in the case of dips, against the buttocks and in the case of pull-ups, against the feet. This pad can have a variety of configurations such as wet suit material or even cloth. It may be stitched or bonded to the loop spring 2 with a variety of glues commercially available.

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Also illustrated in FIG. 1 is an elastic band 10 that is mounted near the mid diameter of the apparatus. This single band 10 adds spring force to the loop spring 2 so that if the user needs additional resistance while doing an exercise, the elastic band 10 can provide such additional assistance. This elastic band 10 can be of any of a variety of elastomeric  
 30 materials such as natural rubber (e.g. rubber bands), butyl rubber, silicone rubber, polyurethane, etc. Additionally, although not shown is the fact that additional bands can be added to increase the resistive force. Prototypes were fabricated using as many as five rubber bands that significantly increased the resistive force.



5 Turning now to FIG. 2, another isometric drawing of the instant invention is illustrated. In this particular embodiment, the user 11 is doing a push-up using the apparatus 1. The apparatus 1 is placed under the user's chest while doing the push-up. As the user 11 begins to do a push-up, the apparatus 1 is compressed as the user 11 allows his or her weight to be applied to the apparatus as the user is going downward. Once the user 11 reaches the floor or near the floor in his or her push-up, and he or she begins to push back up away from the direction of the floor, the apparatus applies a force to the user's body and aids with accomplishing the push-up. Not illustrated is the user 11 doing a dip or pull-up, but the same practice of the apparatus 1 applies to aiding with the force to help the user 11 do the exercise. In this illustration, the user 11 has the spring loop 2 oriented perpendicular to the bodyline, but the device has also been used parallel to the body line (not illustrated) between the breasts. B Also not illustrated is the elastic bands 10 mentioned above. If additional force/assistance would be required by the user, these bands 10 could be added to FIG 2 as is shown in FIG 1.

20 Although the foregoing invention has been described in some detail by way of illustration and example, for purposes of clarity of understanding, it will be obvious that certain changes and modifications may be practiced within the scope of the appended claims.